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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,478	08/16/2001	Joseph S. Hayden	SGT-35	9938

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EXAMINER
BOLDEN, ELIZABETH A

ART UNIT	PAPER NUMBER
1755	6

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application N .	Applicant(s)	
	09/930,478	HAYDEN ET AL.	
	Examiner	Art Unit	
	Elizabeth A. Bolden	1755	

-- Th MAILING DATE of this communication appears n the cover sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☒ Claim(s) *11,12 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4 and 5* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Objections

Claims 11, 12, and 14 are objected to because of the following informalities: minor typographical and grammatical errors.

Claim 11 recites "A glass according to claim 10 essentially free of TiO_2." Claim 11 would be clearer if it was rewritten to recite "A glass according to claim 10 which is essentially free of TiO_2."

The first line of Claim 12 should be corrected to end in a colon rather than a period.

Line 1 of Claim 14 recites "SOC *or* less", this appears to be a typographical error and should be corrected to read "SOC *of* less".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 4, 6, 8-14, and 16-18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ueda et al., U.S. Patent 5,969,861.

Ueda et al. disclose an alkali lead silicate glass having overlapping ranges of components with instant claims 4, 6, and 8-12. See abstract of Ueda et al., and column 5, lines 5-30. The disclosed ranges of components are sufficiently specific to anticipate all the limitations of instant claims 4, 6, 8-12. See MPEP 2131.03. Moreover, Ueda et al. disclose Examples 1-11 and A which meet all the limitations of claims 4 and 9, and Examples 21-26, which are given in wt% but when, converted to mol % meet all the limitations of claims 4 and 9 . See Tables 1-3 and 7-9 of Ueda et al. and the table below for the converted values.

	21		22		23		24		25		26	
	wt%	mol%	wt%	mol%	wt%	mol%	wt%	mol%	wt%	mol%	wt%	mol%
SiO_2	25.9	55.4	25.4	54.8	24.9	54.1	24.4	53.5	23.9	52.8	23.4	52.1
Na_2O	0.9	1.9	0.9	1.9	0.9	1.9	0.9	1.9	0.9	1.9	0.9	1.9
K_2O	0.9	1.2	0.9	1.2	0.9	1.3	0.9	1.3	0.9	1.3	0.9	1.3
PbO	72.0	41.3	72.5	42.0	73.0	42.6	73.5	43.2	74.0	43.9	74.5	44.5
Sb_2O_3	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1	0.3	0.1

Since the composition of the reference is the same as those claimed herein it follows that the glasses of Ueda et al. would inherently possess the same Stress optic coefficient, acid resistance, and climatic resistance as recited in claims 13, 14, and 16-18. See MPEP 2112.

Claims 1, 3, 4, 6, 9, 13, 14, 16, and 18 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ross et al., U.S. Patent 4,721,690.

Ross et al. disclose an alkali lead silicate glass. See abstract of Ross et al. Ross et al. disclose examples Type SF4 Ex. 3 and Type SF6 Ex. 4, which meet all the limitations of claim 10, examples Type SF4 Schott catalog, which meet all the limitations of claims 1, 3, and 9, and example Type SF6 Schott catalog, which meet all the limitations of claims 1, 3, 4, 6, and 9. See Table 2 of Ross et al. and the table below for the converted wt% values. Ross et al. further disclose acid resistance values that meet the recitation of the acid resistance limitation of claims 13, 14, 16, and 18. See Table 2.

	Type SF4 Ex. 3		Type SF6 Ex. 4		Type SF4 Schott catalog		Type SF6 Schott catalog	
	wt%	mol%	wt%	mol%	wt%	mol%	Wt%	mol%
SiO_2	31.4	59.9	27.7	56.6	31.0	61.0	27.3	57.4
Na_2O	0.8	1.5	0.5	1.0	0.8	1.5	0.5	1.0
K_2O	1.9	2.3	1.0	1.3	2.0	2.5	1.0	1.3
PbO	61.5	31.5	67.3	36.9	66.0	34.8	71.0	40.1
ZrO_2	2.7	2.5	2.0	2.0				
TiO_2	1.5	2.2	1.3	2.0				
As_2O_3	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1
SR	1		2		51		52	

Since the composition of the reference is the same as those claimed herein it follows that the glasses of Ross et al. would inherently possess the same Stress optic coefficient and climatic resistance as recited in claims 13, 14, 16, and 18. See MPEP 2112.

Claims 1, 2, 9, 10, 13-15, and 17-19 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Emonts et al., U.S. Patent 4,618,538.

Emonts et al. disclose an alkali lead borosilicate glass. See abstract of Emonts et al. Emonts et al. disclose Example 2 given in wt %, which meet all the limitations of claims 1, 2, 9, 10, and 11. See column 5, lines 30-46 and the table below for the converted values.

		SiO_2	B_2O_3	Al_2O_3	Li_2O	Na_2O	K_2O	MgO	CaO	PbO
Ex. 2	wt%	28.78	3.04	0.03	0.05	1.41	0.74	0.07	0.05	62.89
	mol %	55.03	5.02	0.03	0.19	2.61	0.91	0.2	0.10	32.26

		ZnO	SnO_2	Fe_2O_3	Cr_2O_3	CoO	CuO	NiO	MnO
Ex. 2	wt %	0.33	0.66	0.17	0.28	0.38	0.4	0.40	0.34
Cont.	mol %	0.47	0.50	0.12	0.21	0.58	0.58	0.62	0.55

Since the composition of the reference is the same as those claimed herein it follows that the glasses of Emonts et al. would inherently possess the same Stress optic coefficient and climatic resistance as recited in claims 13-15, 17, and 18. See MPEP 2112.

Claims 4, 6, and 9-11 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Brueck et al., U.S. Patent 6,436,857.

Brueck et al. disclose a lead silicate glass. See abstract of Brueck et al. Brueck et al. disclose example SF11, which meet all the limitations of claim 10, example ZF7, which meet all

the limitations of claims 4, 6, and 9, and example SF7, which meet all the limitations of claims 4, 6, and 9-11. See Table 1 of Brueck et al.

Since the composition of the reference is the same as those claimed herein it follows that the glasses of Brueck et al. would inherently possess the same Stress optic coefficient, acid resistance, and climatic resistance as recited in claims 16-18. See MPEP 2112.

Claims 1, 3, 4, 6, 9-11, and 15-18 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Mori et al., U.S. Patent 6,468,935.

Mori et al. disclose a lead silicate glass. See abstract of Mori et al. Examples 23 and 26 of Mori et al. disclose when converted to mole percent meet all the limitations of claims 1 and 3, Examples 2, 7-10, 12, 17-19, 22-26, 28, 29, 31, 33-40, 43, 44, 46-61, 64, 65, 67-69, 71-76, 78-80, 82, 83, 85, 87, and 88 meet all the limitations of claim 4, Examples 8-10,12, 18, 23-26, 28, 29, 33-40, 43, 44, 46-50, 52-61, 64, 65, 67-69, 71, 73-76, 78-80 meet all the limitations of claim 6, Examples 1-3, 5, 7-13, 16-29, 31, 33-40, 42-51, 53-61, 63-80, 82, 83, 85-88 meet all the limitations of claim 9, and Examples 10, 25, and 85 meet all the limitations of claim 10 and 11. See Tables 1-11 of Mori et al. and the attached table at the end of the action for the converted wt% values.

Since the composition of the reference is the same as those claimed herein it follows that the glasses of Mori et al. would inherently possess the same Stress optic coefficient, acid resistance, and climatic resistance as recited in claims 15-18. See MPEP 2112.

Claims 9 and 12 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kanbara et al., U.S. Patent 4,123,731.

Kanbara et al. disclose an alkali lead silicate glass. See abstract of Kanbara et al. and column 2, lines 15-34. Kanbara et al. disclose Examples 1 and 21, which meet all the limitations of claim 9, and Example 1, which meets all the limitations of claim 12. See Tables 1 and 2 of Kanbara et al. and the table below for the converted values.

		SiO_2	K_2O	PbO	B_2O_3
Example 1	wt %	27	2	71	
	mol %	57.1	2.7	40.2	
Example 21	wt %	28	2	64	6
	mol %	54.2	2.5	40.2	10

Since the composition of the reference is the same as those claimed herein it follows that the glasses of Kanbara et al. would inherently possess the same Stress optic coefficient, acid resistance, and climatic resistance as recited in claims 17 and 18. See MPEP 2112.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8, 10, 11, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanabara et al., U.S. Patent 4,123,731.

Kanbara et al. teach an alkali lead silicate glass. See abstract of Kanbara et al. and column 2, lines 15-34. Kanbara et al. teach Examples 1 and 21, which anticipate claims 9, 12, 17, and 18. See above rejection.

Kanabara et al. differs from the instant claims by not teaching the glass compositional ranges in terms of mol percent.

It appears that the compositional ranges of Kanabara et al. if converted from wt % to mol % would overlap the compositional ranges of instant claims 1-8, 10, 11, and 19, since examples 1 and 21 anticipate the compositional limitations of instant claims 9 and 12. Overlapping ranges have been held to establish *prima facie* obviousness. See MPEP 2144.05.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected from the overlapping portion of the ranges taught by the reference because overlapping ranges have been held to establish *prima facie* obviousness. See MPEP 2144.05.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth A. Bolden whose telephone number is 703-305-0124. The examiner can normally be reached on 8:30am to 6:00 pm with alternating Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark L. Bell can be reached on 703-308-3823. The fax phone numbers for the

organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

DAVID SAMPLE
PRIMARY EXAMINER

EAB
May 2, 2003

Tables of converted examples from Mori et al., U.S. 6,468,935.

	1		2		3		5		7		8		9	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	23	49.7	27.4	57.6	26.5	55.5	25.8	54.7	24.3	47	21	57.4	24	51.4
B_2O_3	3	5.6					1	1.8	1	1.9	1	1.8	0.5	0.9
Na_20			0.5	1	2	4.1	0		1	2.2	0.5	1	0.5	1
K_2O	1	1.4	1	1.3			2	2.7	1.5	2.1	1	1.3		
SrO													5	6.2
BaO	2.5	2.1							5	4.4				
PbO	68.9	39.9	70.9	40	70	39.3	70	39.8	70	42	69	38.1	69.2	39.8
As_2O_3	0.1	0.1	0		0.5	0.3	0		0		0.1	0.1	0.3	0.2
TeO_2	1.5	1.2	0.1	0.1	1	0.8	1	0.8	0.3	0.3	0.5	0.4	0.5	0.4
Sb_2O_3			0.1	0.04			0.2	0.1	0.2	0.1				

	10		11		12		13		16		17		18	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	24.6	51.9	29	59.1	23.7	52.2	24	53.4	23.7	51	28.4	59.3	28.3	59.2
B_2O_3	1	1.8	0.3	0.5	1.5	2.9	1	1.9	3	5.6	0.3	0.5		
Na_20	1	2	0.5	1	0.2	0.3					0.2	0.4	0.2	0.4
K_2O	1.6	2.2	1	1.3			0.4	0.6	0.3	0.4	0.1	0.1		
BaO									2.5	2.1				
PbO	69	39	68.2	37.3	70.9	42	70.9	42.3	68.9	39.7	70.9	39.7	70	39.3
Nb_2O_5							3	1.5						
As_2O_3	0.2	0.1	0.3	0.2	0.3	0.2			0.1	0.1			0.5	0.3
TeO_2	0.6	0.5	0.7	0.5	3	2.5	0.2	0.2	1.5	1.2	0.1	0.1	1	0.8
Sb_2O_3							0.3	0.1			0.1	0.04		

	19		20		21		22		23		24		25	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	28	58.9	27.6	57.7	29	60.2	23.4	51.6	29.3	59.8	24.2	51.9	27	56.2
B_2O_3			1	1.8			1	1.9	1	1.8	0.5	0.9	1	1.8
Al_2O_3													2	2.5
Na_20	0.2	0.4					0.1	0.2	0.1	0.1	0.3	0.6	0.2	0.3
K_2O			0.3	0.3	0.3	0.4	0.1	0.1	0.1	0.1				
SrO											5	6.2		
BaO							5	4.3						

PbO	70.8	40	70	39.3	70	38.9	70	41.5	69	37.8	69.2	39.8	69	38.5
As_2O_3					0.2	0.1			0.1	0.1	0.3	0.2	0.2	0.1
TeO_2	0.7	0.6	1	0.8	0.5	0.4	0.3	0.2	0.5	0.4	0.5	0.4	0.6	0.5
Sb_2O_3	0.3	0.1	0.2	0.1			0.2	0.1						

	26		27		28		29		31		33		34	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	30.3	61.4	24.2	53.8	22.1	49.9	23	51.1	24	52.2	23	50.8	23	50.8
B_2O_3	0.3	0.5	1	1.9	0.5	1	1.5	2.9	0.5	0.9	1.5	2.9	1.5	2.9
GeO_2					2	2.6								
Na_20	0.1	0.1			0.5	1.1	0.5	1.1	0.5	1.1	0.5	1.1	0.5	1.1
K_2O	0.2	0.2	0.2	0.3										
ZnO									2	3.2				
PbO	68.2	37.1	70.9	42.3	74	44.8	73.7	43.9	72.3	42.1	71.2	42.2	71.7	42.5
Nb_2O_5			3	1.5										
As_2O_3	0.3	0.2			0.3	0.2	0.3	0.2			0.3	0.2	0.3	0.2
TeO_2	0.7	0.5	0.2	0.2	0.6	0.5	1	0.8	0.5	0.4	3.5	2.9	3	2.5
Sb_2O_3			0.3	0.1					0.2	0.1				

	35		36		37		38		39		40		42	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	24	53.2	23	51.2	23.1	51.2	24	53.2	23.1	51.3	23.2	51.3	24.1	53.6
B_2O_3	0.5	1	1.5	2.9	1.2	2.3	0.5	1	1.5	2.9	1.5	2.9	0.5	1
Na_20	0.5	1.1	0.5	1.1	0.6	1.3	0.5	1.1	0.5	1.1	0.4	0.9		
K_2O					0.1	0.1							0.5	0.7
PbO	73.8	43.9	74.2	44.3	72.7	43.2	74.2	44.1	74.4	44.4	72.2	42.8	74.3	44.3
As_2O_3	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2		
TeO_2	0.9	0.8	0.5	0.4	2	1.7	0.5	0.4	0.3	0.2	2.4	2	0.5	0.4
Sb_2O_3													0.1	0.04

	43		44		45		46		47		48		49	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	23.3	51.8	22.1	49.7	24.6	54.6	23	51.1	22.9	50.8	23	51.1	22.4	50.5

B_2O_3	1.4	2.7	0.5	1			1.5	2.9	1.7	3.3	1.5	2.9	0.5	1
GeO_2													2	2.6
Na_20	0.3	0.6	1.2	2.6			0.5	1.1	0.6	1.3	0.5	1.1	0.2	0.4
K_2O			0.4	0.6	0.5	0.7	0.1	0.1						
PbO	74.3	44.3	74.2	44.8	74.6	44.4	73.7	43.9	74	44	73.7	43.9	74	44.8
As_2O_3	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.1			0.3	0.2	0.3	0.2
TeO_2	0.5	0.4	1.4	1.2	0.3	0.2	1	0.8	0.8	0.7	1	0.8	0.6	0.5
Sb_2O_3														

	50		51		52		53		54		55		56	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	22.4	50.4	24.3	52.8	18.8	42.3	23.3	51.4	23.3	51.5	24.3	53.7	23.3	51.7
B_2O_3	0.5	1	0.5	0.9	6	11.7	1.5	2.9	1.5	2.9	0.5	1	1.5	2.9
Na_20	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.3	0.5	0.3	0.5
K_2O	2	2.9												
PbO	74	44.6	72.3	42.1	73.7	44.5	71.2	42.2	71.7	42.5	73.8	43.8	74.2	44.3
As_2O_3	0.3	0.2			0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2	0.3	0.2
TeO_2	0.6	0.5	0.5	0.4	1	0.8	3.5	2.9	3	2.5	0.9	0.8	0.5	0.4
Sb_2O_3			0.2	0.1										

	57		58		59		60		61		63		64	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	23.4	51.9	24.3	53.8	22.4	50.4	23.3	51.8	23.4	51.7	24.4	54	23.3	51.8
B_2O_3	1.2	2.3	0.5	1	1.5	2.9	1.5	2.9	1.5	2.9	0.5	1	1.4	2.7
Na_20	0.3	0.6	0.3	0.5	0.2	0.4	0.3	0.5	0.2	0.4			0.3	0.6
K_2O	0.1	0.1									0.3	0.4		
PbO	72.7	43.2	74.2	44.1	74.1	44.7	74.4	44.4	72.2	42.8	74.3	44.2	74.3	44.3
As_2O_3	0.3	0.2	0.3	0.2	0.2	0.1	0.3	0.2	0.3	0.2			0.2	0.1
TeO_2	2	1.7	0.5	0.4	1.6	1.4	0.3	0.2	2.4	2	0.5	0.4	0.5	0.4
Sb_2O_3											0.1	0.03		

	65	66	67	68	69	70	71

	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	23.5	52.6	24.9	55.1	22.5	50.6	23.5	52.1	23.4	51.8	23.3	51.6	23.4	51.9
B_2O_3	0.5	1			1.3	2.5	1.3	2.5	1.5	2.9	1.7	3.3	1.5	2.9
Na_20	0.2	0.3			0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.4	0.2	0.3
K_2O	0.1	0.1	0.2	0.3					0.1	0.1				
PbO	74.2	44.6	74.6	44.3	73.9	44.6	73.6	43.8	73.7	43.9	74	44	73.7	43.9
As_2O_3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.1			0.3	0.2
TeO_2	1.4	1.2	0.3	0.2	2	1.7	1.2	1	1	0.8	0.8	0.7	1	0.8

	72		73		74		75		76		77		78	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	26.3	56.4	23.6	51.7	23.7	52.6	24.9	55.2	23.4	52.2	24.5	54.2	22.4	50.5
B_2O_3	0.5	0.9	2.1	4	1	1.9	0		1.3	2.5	0.5	1	1.5	2.9
Na_20	0.3	0.6	0.1	0.2	0.3	0.6	0.005	0.01	0.02	0.04			0.1	0.2
K_2O											0.1	0.1		
PbO	72.3	41.7	71.3	41.9	71.2	42.4	73.6	43.7	73.7	44.1	73.8	43.9	74.2	44.9
Ga_2O_3			0.1	0.1	1	0.7								
In_2O_3			0.1	0.05	1.5	0.7								
As_2O_3			0.2	0.2	0.4	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.1
TeO_2	0.5	0.4	2.5	2.1	1	0.8	1	0.8	1.2	1	0.9	0.8	1.6	1.4
Sb_2O_3	0.2													

	79		80		82		83		85		86		87	
	wt %	mol %	wt %	mol %	wt %	mol %	wt %	mol %	Wt %	mol %	wt %	mol %	wt %	mol %
SiO_2	23.6	52	22.5	50.8	22.4	50.6	23.4	51.9	23	51.9	23.6	52.1	23.9	51.4
B_2O_3	1.5	2.9	1.3	2.5	1.3	2.5	1.7	3.3	0.5	1	1	1.9	3	5.6
Al_2O_3									1					
Na_20	0.04	0.1	0.04	0.1	0.1	0.2	0.1	0.2	0.1	0.1			0.1	0.1
K_2O			0.05	0.1							0.1	0.1		
BaO											5	4.3	2.5	2.1
PbO	72.2	42.8	74	44.8	74.1	44.9	74	44	74.2	44.8	69.8	41.3	68.9	39.7
As_2O_3	0.3	0.2	0.1	0.1										
TeO_2	2.4	2	2	1.7	2	1.7	0.8	0.7	0.9	0.8	0.3	0.2	1.5	1.2

	88	
	wt %	mol %
SiO_2	28.4	59.5
B_2O_3	0.3	0.5
Na_20	0.1	0.1
PbO	70.9	39.9
TeO_2	0.1	0.1